

# MARSHALL STAR

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## Moonbuggy Racers Ready to Roll April 13-14

*By Rick Smith*

More than 500 high school, college and university students from around the world are converging this week on the "Rocket City" to compete in the 19th annual [NASA Great Moonbuggy Race](#) April 13-14 at the [U.S. Space & Rocket Center](#) in Huntsville.

***Image right: Huntsville Center for Technology racers, anticipating the moonbuggy event. (NASA/MSFC)***

Marshall Space Flight Center team members are encouraged to visit the Space & Rocket Center to watch the excitement. One by one, buggies will take the harrowing course from 7:30 a.m. to approximately 5 p.m. each day. The track, a half-mile of twisting craters, sand traps and obstacles which simulate the harsh environment of the moon, will test the engineering prowess of each team, whose members spent much of the school year designing, building and testing their lightweight, two-driver vehicles.

Can't make it out to the race in person? Watch live coverage on [the social Web service UStream](#). Parents, classmates and race enthusiasts also can use the [Moonbuggy Twitter feed](#) to keep up with real-time course completion times and other race updates -- including winners announced during the closing awards ceremony at 5 p.m. April 14.



In addition to teams representing 20 states and Puerto Rico, the race will host competitors from Canada, Germany, India, Italy, Russia and the United Arab Emirates. The event, organized yearly by the Marshall Center, is a flagship NASA education initiative designed to engage and inspire future generations of scientists, engineers and explorers.

Eight college teams participated in the first NASA Great Moonbuggy Race in 1994. The race was expanded in 1996 to include high school teams, and student participation has swelled each year since. More than 70 teams fielded moonbuggies in 2011; nearly 90 teams are expected this year.

The race honors the legacy of those responsible for designing, building, testing and operating the original NASA Lunar Roving Vehicle, used on the moon's surface in 1971-72 during Apollo 15, 16 and 17 to further scientific exploration of Earth's sole natural satellite.

The event is organized annually by the Marshall Center's Academic Affairs Office. It has been hosted by the Space & Rocket Center since 1996.

Get more race details [here](#), and learn more about other NASA Education initiatives [here](#).

*Smith, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.*

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## Marshall Center Team Bids Farewell to its 11th Center Director -- Robert Lightfoot



The Marshall Space Flight Center team came together April 5 to say goodbye to its 11th center director, Robert Lightfoot, as he takes a new path with NASA as acting associate administrator at Headquarters. At left, Lightfoot thanked the center for its unwavering support and talented work. Lightfoot's career at Marshall began in 1989 as a test engineer and program manager for the space shuttle main engine technology test bed program, and the Russian RD-180 engine testing program for the Atlas launch vehicle program. Lightfoot's new position took effect March 5. His former deputy, Gene Goldman, became Marshall's acting director on that date. To read more about the

leadership change, visit [here](#). (NASA/MSFC/Emmett Given)

Listening to Lightfoot talk about his time at Marshall during the center tribute are, from right, Goldman; Lightfoot's wife, Caroline, and their daughter, Kelsey; Robin Henderson, associate center director; and Margot Thigpen, Lightfoot's executive management assistant. Lightfoot has received numerous awards during his NASA career, including a NASA Outstanding Leadership medal in 2007 for exemplary leadership of the Shuttle Propulsion Office, assuring safety for the return to flight of the space shuttle. In 2006, he was awarded the Presidential Rank Award for Meritorious Executives, and in 2010 he received the Presidential Rank Award for Distinguished



Executives -- the highest honors attainable for federal government work. In 2000, he received a Spaceflight Leadership Recognition Award, which recognizes leaders who exemplify characteristics necessary for success. In 1999, NASA's astronaut corps presented him with a Silver Snoopy Award, which honors individuals who have made key contributions to the success of human spaceflight missions. He also received the NASA Exceptional Achievement Medal in 1996 for significant contributions to NASA's mission. (NASA/MSFC/Emmett Given)



Lightfoot, center, signs his autograph for Jean Payne, a staffing specialist for Will Technology Inc., supporting Marshall's Office of Human Capital. Lightfoot was director of Marshall from August 2009 until March 2012. He served as Marshall deputy director from 2007 to 2009. (NASA/MSFC/Emmett Given)



During the tribute, Lightfoot especially thanked his family for their support during the years. Flanking Lightfoot is his wife Caroline, left, and daughter Kelsey. Their daughter Haley was unable to attend. (NASA/MSFC/Emmett Given)

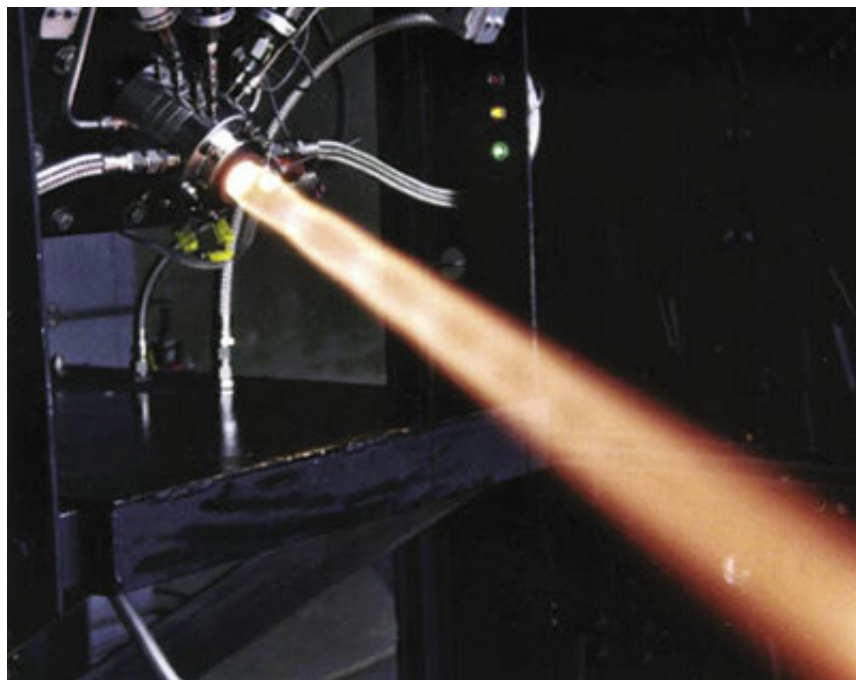


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## NASA Partner Develops High-Pressure System to Extinguish Fires in Seconds

*Combined reports*



Orbital Technologies Corp., or ORBITEC -- in partnership with the Marshall Space Flight Center -- has developed a new approach to rocket engine design, leading to a spinoff technology that can suppress a fire in mere seconds.

***Image left: Through NASA's Small Business Innovation Research program, Orbital Technologies Corp., or ORBITEC, developed vortex combustion technology representing a new approach to rocket engine design. ORBITEC's NASA work led to advancements in fire suppression systems by the company's subsidiary, HMA Fire. (NASA)***

The technology, called ultra-high-pressure firefighting, was developed by ORBITEC's

Madison, Wis.-based subsidiary, HMA Fire. It improves the efficiency of fire suppression systems by reducing the time and amount of water needed to extinguish a blaze.

HMA Fire spun off the ultra-high-pressure firefighting system from ORBITEC's rocket engine design work for NASA through the agency's Small Business Innovation Research, or SBIR, program. SBIR is a highly competitive award system that provides qualified small business concerns with opportunities to propose innovative ideas that meet the specific research and development needs of the federal government. ORBITEC is a long-time NASA partner, working with the agency on many projects through the SBIR program, including propulsion technologies.

ORBITEC developed a way to inject liquid fuel into a rocket combustion chamber in a circular motion at a high pressure. The

design confined the mixing and burning of the fuel to the chamber's core, while keeping the chamber wall cooler. The same premise was used by HMA Fire for the firefighting system. The system's key component is the high pressure of the discharge, which results in smaller droplets spread on the fire. The smaller droplets create four times the total surface area of the larger droplets from standard, low-pressure systems. The small-droplet spray quickly extinguishes a fire, resulting in rapid-temperature reduction and less smoke around a blaze.

"What this does is create a safer environment for the firefighters to conduct an offensive suppression attack on the fire," said HMA Fire chief engineer Rory Groomwald. "The fire industry still has a mentality of 'surround and drown' -- the more water you put around a fire, the faster the fire will go out. But that is not necessarily true."

In a test at Vandenberg Air Force Base, Calif., a regular fire hose put out a fire in one minute, 45 seconds using 220 gallons of water. The HMA system extinguished an identical fire in 17.3 seconds with 13.6 gallons of water, using a hose managed by one person.

"Government partnerships like those between HMA Fire, ORBITEC and NASA have supported the research and development leading to the creation of these game-changing firefighting tools," said Marty Gustafson, ORBITEC engineer and applications research manager.

She added, "This is where the government-industry partnerships make a difference. They allow you to prove out a technology in a way that gives you instant credibility."

To learn more about NASA spinoffs, visit <http://spinoff.nasa.gov>.

*Cotton, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.*

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## **Marshall Center Model Shop Creates 'Out-Of-This-World' Replicas, Makes SLS Vision a Hands-On Reality**

*By Amie Cotton*

Barry Howell, a model maker supporting the Office of Strategic Analysis & Communications, adds the top portion of a new 6-foot-5-inch, 1:50-scale Space Launch System model created in the Marshall Space Flight Center's model shop in Building 4631. Three SLS models of this scale have been painstakingly crafted for outreach efforts for NASA's Human Exploration and Operations Mission Directorate. To date, the model shop technicians also have built 15 1:100-scale models of the SLS vehicle. Made of a casting plastic called aluminite, a model is created by forming an original rubber mold of each piece, pouring and curing the aluminite mixture, assembling the pieces and painting them. This model required 14 different molds and took about five weeks to replicate and construct. The models are being shipped this week for exhibit at the National Space Symposium in Colorado Springs, and the Space Propulsion 2012 Conference in Bordeaux, France, as well as to the National Air and Space Museum's Steven F. Udvar-Hazy Center near Washington for the space shuttle Discovery delivery celebration. The Marshall model shop has been in operation since the early 1960s and its technicians have built thousands of models to support agency programs. Howell, an AI Signal Research Inc. employee in the Public & Employee Communications Office, has worked in the model shop for 43 years. The SLS Program is designing and delivering the nation's next human-rated flagship space launch vehicle, capable of carrying crew and cargo to deep space. (MSFC/Emmett Given)



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## **Challenges of Managing the Space Shuttle Program: Early Shuttle Managers to Participate in Panel Discussion April 17**

*Submitted by Linda Posey*

NASA's first space shuttle mission lifted off from the Kennedy Space Center on April 12, 1981, when the orbiter Columbia, carrying crew members John Young and Robert Crippen, rocketed into space. This was the first manned space mission of a launch vehicle that had not previously flown unmanned, and its successful flight was a momentous achievement.

The flight was the culmination of many years -- 1970-1981 -- of design, development and testing of the propulsion elements of the space shuttle. Leading this effort were three Marshall Space Flight Center project managers: James R. Thompson of the Space Shuttle Main Engine Office, George Hardy of the Solid Rocket Booster Project and Jim Odom of the External Tank Office.

On April 17 at 5:30 p.m., the Marshall Retirees Association, in partnership with the U.S. Space & Rocket Center, will present these managers in a panel discussion of their views about the challenges and issues of managing in the post-Apollo era. The event will be in the 3-D theater at the Davidson Center for Space Exploration. This is part of the "[Pass the Torch](#)" series of panels hosted by the Space & Rocket Center. There is no admission charge.

For more information, contact Linda Posey, president of the Marshall Retiree Association, at 544-0118.

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## Obituaries

**Arlie Graham**, 91, of Rogersville died March 6. He retired from the Marshall Center in 1974 as an industrial specialist. He is survived by his wife, Mary Lois Graham.

**Homer Bernard Wilson Jr.**, 86, of Lacey's Spring died March 29. He retired from the Marshall Center in 1986 as an engineer. He is survived by his wife, Mary Yeager Wilson.

**Richard John Schock Sr.**, 83, of Huntsville died April 1. He retired from the Marshall Center in 1974 as an aerospace engineering technician.

**Dewey Leon Parker**, 90, of Moulton died April 3. He retired from the Marshall Center in 1976 as a supply clerk.

**James Edward Blanton Sr.**, 83, of Huntsville died April 5. He retired from the Marshall Center in 1981 as an aerospace engineering supervisor.

## Find this article at:

<http://www.nasa.gov/centers/marshall/about/star/index.html>